W. H. STEVENS.

ELECTRICALLY CONTROLLED LOCK.

APPLICATION FILED DEC. 29, 1906.

908,813.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

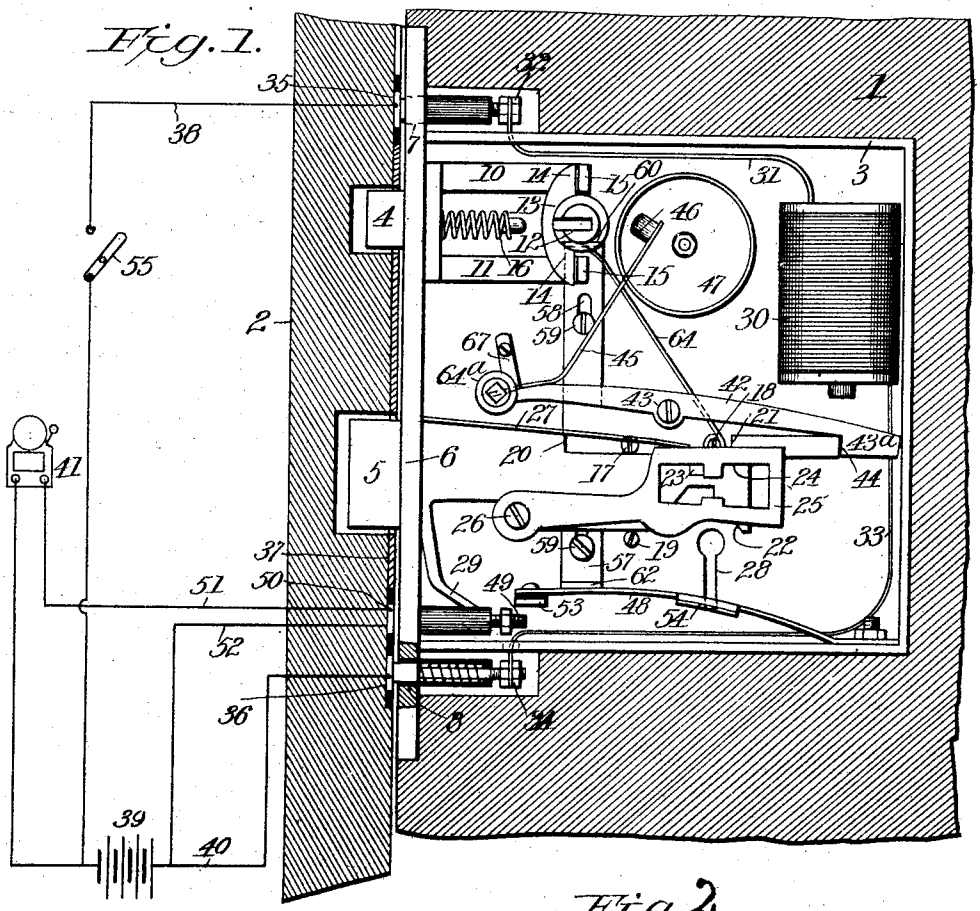


Fig. 2.

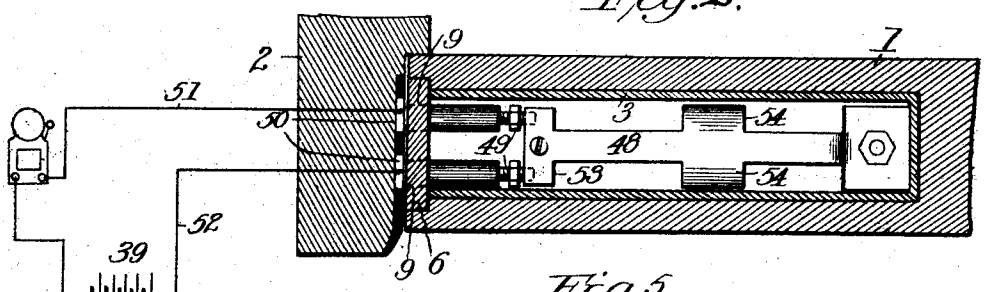
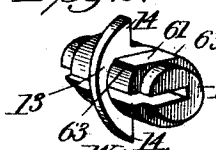


Fig. 4.



Fig. 5.



Witnesses

C. H. Walker.

W. C. Goodwin

Inventor

William H. Stevens.

By Theodore Dalton

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

W. H. STEVENS.

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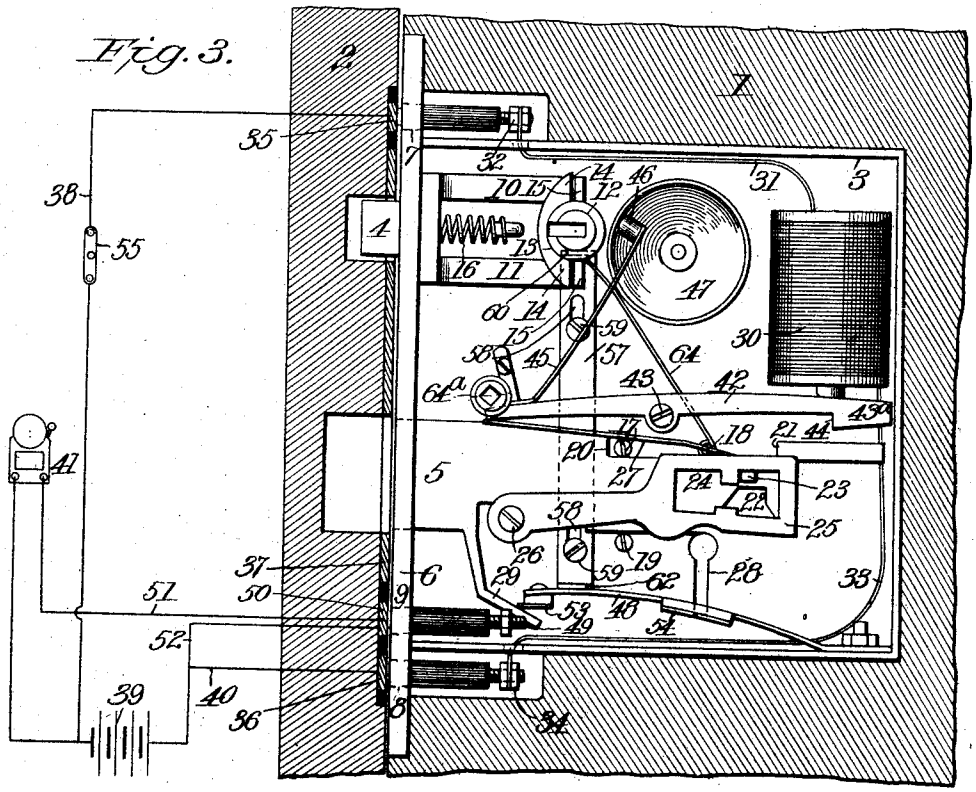
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2 SHEETS—SHEET 2.

Fig. 3.



Witnesses

C. M. Walker

Geo. C. Hoberecht

Inventor

William H. Stevens.

By Theodore Dalton

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. STEVENS, OF GREENWOOD, MISSISSIPPI.

ELECTRICALLY-CONTROLLED LOCK.

No. 908,813. Specification of Letters Patent. Patented Jan. 5, 1909.

Application filed December 29, 1906. Serial No. 349,992.

To all whom it may concern:

Be it known that I, WILLIAM H. STEVENS, a citizen of the United States, residing at Greenwood, in the county of Leflore and State of Mississippi, have invented certain new and useful Improvements in Electrically-Controlled Locks, of which the following is a specification.

This invention relates to electric locks.

One object of the invention is to provide a combined lock and latch embodying such characteristics that the locking bar may be held normally in locking position.

Another object of the invention resides in the provision of a key controlled lock bar having means operating therewith to hold it against operation with means operating with the aforesaid means to operate the latter and permit of operation of the bar.

A still further object is to provide a key controlled lock bar having means operating therewith to hold it against operation with means operating with the aforesaid means to operate the latter and permit of operation of the bar, there being means provided for operation upon the operation of the second mentioned means to operate a signal.

It is still further designed to provide a key controlled lock bar having electric means associated therewith whereby the bar is held against operation and by the same means when operated in a suitable manner to permit of operation of the bar, there being associated with the lock mechanism a mechanical means constructed and arranged to hold the locking bar means out of operative position when desired.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and particularly pointed out in the appended claims, it being understood that changes may be made in the form, proportion, size and materials without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a sectional elevation of my invention, illustrating the door secured in its locked position. Fig. 2 is a horizontal sectional view. Fig. 3 is a view similar to Fig. 1, illustrating the locking elements of the lock in position whereby the door may be opened. Fig. 4 is a detail perspective view of the spindle for locking the armature in inoperative position. Fig. 5 is a detail perspective view of the roll-back.

Referring now more particularly to the accompanying drawings, the reference characters 1 and 2 indicate a door and door frame, respectively, there being a lock casing 3 fitted in a mortise of the door and having the usual latch and lock bar elements 4 and 5, respectively. It will be seen that the facing 6 of the lock that abuts with the door frame extends preferably above and below the casing 3 and the extending portions of this face plate are provided with upper and lower perforations 7 and 8, respectively, and also with a pair of alining perforations 9 immediately above the lower perforation 8 and entering the interior of the casing, these perforations 7, 8 and 9 being designed for a purpose presently explained.

While any particular form of latch and lock bars may be employed, I show in the accompanying drawings, merely for the purposes of illustration, two well known forms of bars, and as shown, the latch bar is bifurcated to form the spaced legs 10 and 11 adapted to embrace the hub 12 of the roll-back 13 whose fingers 14 engage the angular extensions 15 of the legs 10 and 11 of the latch bar, so that when the roll-back 13 is turned in manipulating the knob of the lock, the latch bar will slide inwardly and outwardly of the casing 3 according to the manipulation of the knob spindle, the latch bar being preferably placed under tension to hold it normally outwardly of the casing by means of a helical or other spring 16.

The lock bar is arranged to slide inwardly and outwardly of the casing between the upper posts 17 and 18 and the lower post 19, the top of the lock bar being notched to form the shoulders 20 and 21, the shoulder 20 engaging the post 17 to limit the inward movement of the bar, and the shoulder 21 engaging the post 18 to limit the outward movement thereof.

The lock bolt is provided with a key receiving notch 22 immediately above which is disposed a projection 23 adapted to cooperate with the communicating notches 24 of the tumbler 25 of the lock bar, said tumbler being pivotally mounted upon the post 26 and held normally downwardly with respect to the lock bar by means of the flat or other spring 27 carried by the lock bar.

When the key is inserted in key slot 28, this tumbler 25 is adapted to be moved upwardly against the action of the spring 27 as the key is turned to manipulate the lock bar. The lock bar carries a circuit breaking projection 29 for a purpose presently explained.

Mounted in the upper portion of the casing is an oval or other shaped magnet 30 connected by wire 31 to the slidable contact member 32 and by wire 33 with the sliding contact 34, the contacts 32 and 34 extending through the aforesaid upper and lower perforations 7 and 8 of the frame abutting face 6 of the casing 3 for electric contact with the fixed contacts 35 and 36, respectively, secured in any suitable manner to the door jamb and below the keeper plate 37, there being a wire 38 leading from the contact 35 to the battery 39 and a wire 40 leading from the contact 36 to the battery 39.

Coöperating with the magnet 30 is an armature 42 pivoted intermediate its ends by means of a suitable pivot 43, one end of the armature 42 being enlarged as at 43a to provide a shoulder 44 adapted to lie normally behind the rear end of the lock bar 5 to hold the latter normally in locked position. When the magnet 30 is energized in a manner hereinafter explained, the armature 42 is lifted into engagement therewith to permit of moving the lock bar 5 inwardly of the casing to unlock the door. Mounted on the outer end of the armature 42 is a clapper arm 45 provided with a striking element 46 designed to engage the bell 47 to sound an alarm when the armature 42 is lifted by the magnet 30.

Fixedly mounted at one end to the bottom of the casing 3 in any suitable manner is a plate 48 curving upwardly and passing the lower portion of the key slot 28 and downwardly toward the inner ends of the pair of sliding contacts 49 mounted in the aforesaid pair of openings 9 of the face 6 of the casing 3 and adapted to coöperate with the pair of fixed contacts 50 disposed immediately beneath the keeper plate 37 and directly above the aforesaid contact 36, there being wires 51 and 52 leading to the bell 41 and the battery 39, respectively. At the free end of the spring plate 48 is secured thereto and insulated therefrom a contact member 53 adapted to contact with the pair of slidable contacts 49 when the key of the lock is inserted in the key slot 28. In other words, the spring plate 48 is enlarged laterally at its point of intersection with the key slot 28 and curved downwardly as at 54, so that when a key is inserted in said slot the spring plate will be depressed by the key to throw the contact 53 into engagement with the sliding contacts 49 and ring the bell 41, which latter is arranged preferably remote from the lock to warn occupants of a dwelling that a person is attempting to unlock the door. As the key is turned the spring plate is released. While the circuit between the spring plate 48 and the bell 41 by way of the battery 39 and wires 51 and 52 may be closed by the spring plate 48, the door cannot be unlocked by the person from the outside until an occupant of the dwelling manipulates the push button or other switch 55 arranged in the line of the wire 38. This push button or switch 55 may be arranged in any part of the building desired and when manipulated to close the circuit, the current will flow through the wires 38 and 40 to the contacts 35 and 36, thence through the sliding contacts 32 and 34 and the wires 31 and 33 to the magnet 30, energizing the latter, and lifting the armature 42 so that its shoulder 44 may be lifted out of the path of the lock bar to permit further turning of the key of the lock to shift the lock bar inwardly of the casing and out of its locked position.

The outsider may know when the occupant of the building has manipulated the switch 55 by the sounding of the alarm within the lock, because when the armature 42 is lifted by the magnet 30, the striker arm 45 at one end of the arm will be moved accordingly to throw its clapper 46 into engagement with the alarm bell 47.

My improved lock is so constructed that the occupants of the dwelling will be warned of an attempt by an outsider to gain admission not only when a key is inserted in the key slot 28, but even in the event that the knob spindle should be turned to shift the latch bar 4. For this purpose, I arrange a conductor strip 57 within the casing and provide it with slots 58 whereby it may be slidably mounted upon the projections 59 to move toward and away from the roll-back 13 and the spring plate 48 with both of which it lies normally in engagement, there being an angular portion 60 at the upper end of the conductor strip for engagement with the flat face portion 61 of the roll-back and an angular portion 62 at its lower end for engagement with the spring plate 48. As shown in Fig. 1, the angular portion 60 of the conductor strip 57 is lying flush with the flat face portion 61 of the roll-back, and if the roll-back is turned by the knob spindle in the usual manner, it will cause either end 63 of the flat portion 61 to force the conductor strip 57 downwardly against the action of its supporting spring 64 and throw the contact 53 into engagement with the pair of slidable contacts 49, resulting in the ringing of the bell 41. The occupant of the dwelling may then operate the switch 55 to energize the magnet 30 and lift the armature 42 so that the lock bar 5 may be shifted inwardly of its casing to permit of opening

of the door, the lifting of the armature 42 in this instance, as in the aforesaid instance, sounding the alarm 47 to notify the outsider that the occupants have manipulated the switch 55 and placed the lock in condition for operation by him.

When it is desired to use the device as an ordinary lock, the armature is held out of the path of movement of the lock bar by means of the rotatable spindle 64^a. This spindle 64^a is provided with a notch 65 arranged so that when the spindle 64^a is turned upwardly to throw its shoulder 66 into engagement with the stop 67, the armature may have its normal pivotal movement, but when the spindle 64^a is turned downwardly to throw the shoulder or end 68 of the notch 65 into engagement with the armature, the latter will be thrown upwardly and held out of the path of the lock bar 5 to permit the lock bar to slide to its inward position, and when the lock bar 5 is in its inward position, its contact breaking element 29 engages between the pair of sliding contacts 49 and contact 53 to hold the circuit open and thereby prevent the ringing of either bell 41 or 47 when the lock is operated.

From the foregoing it will be understood that my improved lock and latch may be used either to merely latch the door or to latch and lock it against opening from the outside with or without assistance from the inside. It will also be understood that the electric connections may embody more than one bell or other alarm, in that a series of bells or alarms may be connected in series, and obviously, one or more bells or other alarms might be connected in the circuit with the other bells or alarms or alone for location at some distant point, or in a building other than the one in which the lock is located. Another important feature of my invention resides in the fact that the slightest tinkering with the lock by an outsider will warn an insider or a person hearing the alarm that the lock is being tinkered with, and it is manifest that an attempt to pick the lock would not be successful, for the reason that an instrument could not be very well inserted in the key slot to hold the armature from engagement with the lock, and should such instrument be used, it is obvious that the instrument would have to be withdrawn to permit of the insertion of the regular key, for the regular key could not be inserted in the key slot while a picking instrument is inserted in the key hole slot.

What is claimed is:—

1. The combination with a key controlled lock bar, of an armature pivoted intermediate its ends and having one end enlarged to form a shoulder for engagement behind the lock bar to hold the same in its locked position, an electro-magnet confined within the lock casing and operating to lift the armature out of the path of movement of the lock bar to permit of movement of the lock bar to its unlocked position, and a signal coöperating with the armature.

2. The combination with a key controlled lock bar, of an armature pivoted intermediate its ends and having one end enlarged to form a shoulder for engagement behind the lock bar to hold the same in its locked position, an electro-magnet confined within the lock casing and operating to lift the armature out of the path of movement of the lock bar to permit of movement of the lock bar to its unlocked position, and means independent of the electro-magnet to hold the armature from behind the lock bar.

3. The combination with a key controlled lock bar, of an armature having a portion projecting behind the bar to hold the same in its locked position, an electro-magnet confined within the lock casing and operating to lift the armature out of the path of movement of the lock bar to permit of movement of the same to its unlocked position, means independent of the electro-magnet to hold the armature from behind the lock bar, and a signal coöperating with the armature.

4. The combination with a key controlled lock bar, of an armature constructed and arranged to hold the lock bar against inward movement, an electro-magnet to operate the armature, and means independent of the electro-magnet, the lock bar and the key of the lock to hold the armature from behind the lock bar to permit of a subsequent movement of the locking bar to unlocked position under the influence of the key.

5. In a lock of the class described, the combination with a key controlled lock bar, of movable means for locking the bar against the action of the key, a signal actuated by the movement of said locking means, an electric means within the casing to release the lock bar locking means, and means wholly independent of said electric means, the lock bar, and the key of the lock to hold the locking means out of operative position.

6. The combination with a key controlled lock bar, of an armature adapted to hold the lock bar against operation, an electro-magnet within the casing and operating to move the armature away from the lock bar to permit of the operation thereof, contact members having connection with the electro-magnet, and means independent of the lock bar and the key of the lock for holding the armature out of operative relation with the lock bar to permit of a subsequent movement of the lock bar to unlocked position under the influence of the key.

7. The combination with a key controlled lock bar, of an armature adapted to hold the lock bar against operation, an electro-

magnet within the casing and operating to move the armature away from the lock bar to permit of operation of the latter, contact members having connection with the electro-magnet, and manually operated means mounted for rotation into and out of engagement with one end of the armature to hold the latter out of operative position.

8. The combination with a keeper plate carrying fixed contacts, of a key controlled lock bar, an electro-magnet in the lock casing and operating to move the armature out of the path of the lock bar to permit the operation thereof, contacts having connection with the magnet and arranged for engagement with said fixed contacts, a signal coöperating with the armature, and means independent of the electro-magnet to hold the armature out of operative position.

9. The combination with a lock bar, of an armature arranged to hold the lock bar against inward movement, an electro-magnet to operate the armature, means independent of the electro-magnet the lock bar and the key of the lock to hold the armature from behind the lock bar to permit of a subsequent movement of the lock bar to unlocked position under the influence of the key, a bell in the lock casing, and a clapper arm carried by the armature for engagement with said bell when the armature is moved from behind the lock bar.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM H. STEVENS.

Witnesses:
JOHN H. SIGGERS,
GEO. C. SHOEMAKER.